

CLAIMS

1. A particle for use in transport of substances
5 through biological membranes, characterised
in that it contains at least one magnetically inducible
material and at least one difunctional molecule with at
least one binding site for said substance and with at
least one binding site for said biological membrane.
- 10 2. A particle as claimed in claim 1, characterised
in that said magnetically inducible material contains iron oxide, iron oxide hydrate, gamma
Fe₂O₃, Fe₃O₄, iron oxides containing metal ions such as
Co, Ni, Mn, Be, Mg, Ca, Ba, Sr, Cu, Zn, Pt, Al, Cr, Bi,
15 rare earth metals or mixtures thereof.
3. A particle as claimed in claim 1 or 2, characterised
in that said difunctional molecule is
a lectin such as Concanavalin A, transferrin, avidin,
selectins, DNA, RNA, antibiotics, hormones, polyelectro-
20 lytes, antibodies, antigen, synthetic peptide, peptide,
virus protein, polylysin, DNA polymerase, RNA polymerase,
ligase, exonucleases, endonucleases, zinc fingers,
repressors or promoters.
4. A particle as claimed in any one of claims 1-3,
25 characterised in that said difunctional molecule
is a recombinant fusion protein or a fusion molecule
between at least two of the following units: lectin, such
as Concanavalin A, transferrin, avidin, selectins, DNA,
RNA, antibiotics, hormones, polyelectrolytes, antibodies,
30 antigen, synthetic peptide, peptide, virus protein,
polylysin, DNA polymerase, RNA polymerase, ligase, exonucleases,
endonucleases, zinc fingers, repressors or
promoters.
5. A particle as claimed in any one of claims 1-4,
35 characterised in that it is a particle with
an average diameter in the range of about 1 nm to about
10 μ m.

6. A particle as claimed in any one of claims 1-5, characterised in that it contains an indicator such as a colourant, a fluorescent material, a radioactive material, a chemoluminescent material or an enzyme.

7. A particle as claimed in any one of claims 1-6, characterised in that it contains a bilayer membrane component which can be made up of, for instance, phospholipids and/or cholesterol.

8. A method for transporting substances through biological membranes, where the particle as claimed in any one of claims 1-7 is mixed with membrane-enclosed structures and is allowed to be incubated for about 1 min to about 3 h, after which the formed particle membrane complex is exposed to an alternating magnetic field.

9. A method as claimed in claim 8, wherein the frequency of the alternating magnetic field is within the range of about 10 Hz to about 100 MHz with a field strength within the range of about 1 to about 100 Oerstedt.

10. Use of the particle as claimed in any one of claims 1-7 for membrane transport of substances such as DNA, RNA, PNA, protein or part thereof, peptide, viruses, polymers, pharmaceutical preparations and steroids.

11. Use of the particle as claimed in any one of claims 1-7 for biochemical work, transfection, transformation, gene transfer, gene expression control, cell differentiation control, protein expression control, protein synthesis, *in vivo* protein activity measurement, gene modification of viruses/protozoa/mould/bacteria and/or organelles therein/bacteriophages/plant cells and/or organelles therein/mammal cells/primary cells/stem cells.